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sitic micro-fungi. Beside the usual data on the labels some synonymy is given, and also the original description of the species *verbatim et literatum*. An entirely new feature of the distribution, and one to be commended highly, is the exact reproduction of the labels in the form of a journal article, to be distributed as separates. The first issue is in the *Ohio Naturalist* (**2** : 135–140) of last November. Beside the labels, there is a page of introductory matter.—J. C. ARTHUR.

THE *Bulletin de l'Herbier Boissier* has undertaken to publish a card index[13] of the new species appearing since January 1, 1901. The cards are intended to be intercalated with those published in this country by Miss Josephine E. Clark. Unfortunately they are printed in sheets upon thin paper and are perforated for separation. The light weight of the stock, the uneven size of the cards, and the ragged perforated edges will certainly prove exasperating to those who undertake to insert these among any standard series of cards. The data furnished will be extremely valuable, but we fear the form of the publication will nullify the laudable intentions of the editor. —C. R. B.

NOTES FOR STUDENTS

GIOVANNOZZI has studied[14] the mechanism and functions of hygroscopic movements in plants. Among the topics treated are movements of floral bracts and anthers, leaf movements, opening and closing of fruits, torsion of awns, movements of the branches of conifers, dispersal of spores. Most commonly there is an unequal swelling of neighboring tissues, sclerenchymatous cells in particular possessing great capacity for taking up water.—H. C. COWLES.

DR. A. ZIMMERMANN has discovered in the "scattered, large, thickened, hard warts" described by Trimen in *Pavetta indica*, as well as in some other allied species of Rubiaceae, the presence of masses of bacteria which penetrate into intercellular spaces of the leaves while they are still very young and there develop into huge masses. The presence of these bacteria produces the wart. What are the relations between the two organisms remains for later experimental investigation.[15]— C. R. B.

MITOTIC PHENOMENA in the flagellate, Polytoma, are described by

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[13] Index botanique universel des genres, espéces et variétés de plantes, parus depuis le 1^er^ janvier 1901. Publié par le Bulletin de l'Herbier Boissier, Chambésy, suisse. 25 fr. par an. Suite à Index Kewensis. Ces fiches sont destinées a être intercalées avec les "Card-Index Clark" américaines.

[14] Nuov. Giorn. Bot. Ital. **8** : 207–237. 1901.

[15] ZIMMERMANN, A.: Ueber Bakterienknoten in den Blättern einiger Rubiaceen. Jahrb. Wiss. Bot. **37** : 1–12. *figs. 1–9*. 1901.

Prowazek.[16] Of special interest is his account of a nuclear centrosome somewhat similar to that described for Euglena and some other flagellates. A minute body makes its appearance in the nucleus, moves to the periphery, and is thrown out, surrounded by a clear area of protoplasm. The body then divides and the daughter centrosomes, taking position at opposite ends of the elongated nucleus, become the poles of the spindle.— B. M. DAVIS.

ITEMS OF TAXONOMIC INTEREST are as follows: CARL PURDY (Proc. Calif. Acad. Sci. III. Bot. **2**: 107–150. *pls. 15–19.* 1901) has published a revision of *Calochortus*, not including the Mexican species. He recognizes 40 species, describing 5 as new.—T. D. A. COCKERELL (Torreya **1** : 142–143. 1901) has proposed a new genus (*Hesperaster*) founded on *Bartonia decapetala* Sims (not the earlier *Bartonia* Muhl.) to include also certain species heretofore referred to *Mentzelia*. Under this new generic name 9 species are placed.—J. C. ARTHUR (Bull. Torr. Bot. Club **28** : 661–666. 1901) has begun a series of publications entitled " New species of Uredineae," the first installment containing 12.—ALICE EASTWOOD (*idem*, 667–674) in publishing some notes on Californian species of *Delphinium* has described 4 new species. —J. M. C.

J. W. MOLL[17] has devised an apparatus for focusing the projecting microscope from a distance. In order to give the demonstrator at the screen control over the focusing arrangement when very high magnification is desired, he arranged, after the object has been brought to approximate focus, to change the focus by sliding the ocular in and out. The ocular is fixed to a sliding block and is entirely independent of the part carrying the objective. A wire cord, attached to the front of the ocular carrier, passes around a pulley, thence over another pulley fixed to the ceiling, then to a wheel and axle arrangement near the screen. A cord with an adjustable handle is attached to the wheel. Two stout spiral springs in front of the ocular carrier return it into place when the tension of the cord is relaxed. The arrangement enables the demonstrator to control the focusing from any position near the screen.—W. J. G. LAND.

I. KOSIŃSKI has published in a recent number of Pringsheim's *Jahrbücher* a paper on the influence of various conditions on the respiration of *Aspergillus niger*.[18] It appears that when the fungus is deprived of food respiration very promptly diminishes. Growth is suspended at the same time, beginning again, with the increased respiration, upon the return of nutriment. A sudden increase in the concentration of the surrounding medium decreases the respiration, and *vice versa.* Severe mechanical injury accelerates respiration, as shown much better by Richards for phanerogams. Respiration is accelerated by the presence of zinc, iron, and manganese, cocaine, strychnine, and sufficiently dilute ether. The variation in the results (CO_2 evolved) from hour to hour is so excessive in many of the tables that if the conclusions should be called seriously in question they would be found supported here by very weak evidence.—E. B. COPELAND.

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[16] PROWAZEK: Kerntheilung und Vermehrung der Polytoma. Oester. Bot. Zeits. **51** : 51. 1901.

[17] Proc. Roy. Soc. Amsterdam **4** : 95–101. *1 pl.* 1901.

[18] I. KOSIŃSKI: Die Athmung bei Hungerzuständen und unter Einwirkung von mechanischen und chemischen Reizmitteln bei *Aspergillus niger*. Jahrb. Wiss. Bot. **37**: 137–204. 1901.

IKENO describes[19] conditions of spore formation in Taphrina that suggest the need of further studies of this type and other members of the Exoasceae. Two nuclei, present in the young ascus, unite to form a large nucleus characterized by a conspicuous nuclelous. The latter appears to be chromatic in character. The nuclear membrane shortly disappears and the chromatin body proceeds to fragment. Ikeno found no mitotic phenomena. The chromatin globules simply split up until a number are present in the cytoplasm. These small chromatin bodies then gather in groups in a common vacuole. Each body takes to it a certain amount of cytoplasm and a membrane formed around the whole completes a spore. The spores later multiply greatly by budding. It should be noted that Ikeno has failed to find here the process of spore formation described by Harper in the ascus, nor is there yet the progressive cleavage characteristic of the Phycomycetes.— B. M. DAVIS.

PART of the recent literature on the physiology of reproduction is summarized by Klebs[20] and utilized as the basis of an estimate of the most promising lines of work for the immediate future. The influence of light, transpiration, and various foods on the initiation of the reproductive processes have so far been found reasonably constant. But to justify generalization there is urgent need of a physiological study of reproduction in a considerable number of phanerogams. Conditions which do not directly affect the initiation of the reproductive processes may greatly influence their subsequent course. Growth and reproduction are in antagonism to the extent that either, under favorable conditions, demands all available plastic matter. The demands of growth on any external condition are less strict than those of reproduction. Klebs brings up more points in his condensed fifteen pages than can even be mentioned in a review—among them, the relation of heredity and environment as controlling factors ; the interrelation of various modes of reproduction (a question of minor importance among higher plants); double fertilization and xenia. The possibility is pointed out, and it seems to the reviewer little short of a certainty, that we must yet recognize cases in which the hereditary character of the male gametes has an influence outside of either embryo or endosperm, in the seed coats and fruit.— E. B. COPELAND.

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[19] IKENO : Spore formation in Taphrina. Flora **88** : 229. 1901.

[20] KLEBS, G.: Einige Ergebnisse der Fortpflanzungs-Physiologie. Ber. Deutsch. Bot. Gesells. **18** : 201–215. 1900.

THE effect of various kinds of nutrition on the formation of enzymes has been carefully considered by Went in experiments on *Monilia sitophila.*[21] This fungus he had previously studied in Java and fully described in *Centralblatt für Bakteriologie* 72: 1901, where also he discusses its culture in relation to different foods. It may develop ten different enzymes, all except trehalase formed in the culture fluid (though not all under like conditions), from which they may be precipitated by alcohol. They are malto-glucase (as Went prefers to name the enzyme which changes maltose into glucose), trehalase, raffinase, invertase, cytase, diastase, lipase, tyrosinase, lab enzyme, and trypsin. No retardation of the formation of the enzymes by the products of their activity could be observed in maltoglucase, invertase, diastase, or lipase.

The table below is an attempt to show diagrammatically the influence of the various materials upon enzyme development. More minute details as to the kinds of food tested must be sought in the paper itself. The sign + shows that the enzyme is formed with this food; the sign O, that it is not; –, that the case was not investigated.

	Casein	Peptone	Maltose	Raffinose	Glucose	Glycerin	Acetic acid
Lab enzyme	+	+	O	O	O	O	O
Trypsin	+	+	O	+ ?	O	O	O
Tyrosinase	+	+	+	+	+	+	+
Maltoglucase	+	+	+	+	O	O	O
Invertase	–	+	+	+ ?	+	+	+
Diastase	–	+	+	+	+	+	+

It is thus clear that in the same plant the different enzymes are affected differently by different foods. The danger of generalizing too widely from the few facts as yet ascertained is obvious. These experiments also help to do away with the idea, quite widely entertained, that enzyme development indicates a kind of starved condition of the cell. Usually it is only well nourished cells which develop much enzyme.—NINA G. HOLTON.

[21] WENT, F. A. F. C.: Ueber den Einfluss der Nahrung auf die Enzymbildung durch *Monilia sitophila* (Mont.) Sacc. Jahrb. Wiss. Bot. **36**: 611–664. 1901.